IJIRR

International Journal of Information Research and Review
Vol. 02, Issue, 12, pp. 1447-1449 December, 2015

Research Article

ESTIMATION AND ASSESSMENT OF PROTEIN C/S AMONG SUDANESE PATIENTS IN ALJAZEERA STATE WITH CHRONIC RENAL FAILURE

*Dr. Nadia Madani Mohamad and Basma Alsiddig

Alneelain University, Faculty of post graduate, Sudan

ARTICLE INFO

Article History:

Received 09th, September 2015
Received in revised form
13th, October 2015
Accepted 26th, November 2015
Published online 30th, December 2015

Keywords:

Chronic kidney disease,
cardiovascular disease,
Protein.

ABSTRACT

Background:
Chronic renal failure: Chronic kidney disease (CKD) describes abnormal kidney function and/or structure. There is evidence that treatment can prevent or delay the progression of CKD, reduce or prevent the development of complications, and reduce the risk of cardiovascular disease (CVD). The definition of CKD is based on the presence of kidney damage (ie albuminuria) or decreased kidney function (ie glomerular filtration rate (GFR) <60 ml/minute per 1•73 m²) for three months or more, irrespective of clinical diagnosis.
Protein C &S

INTRODUCTION

Protein C, also known as autoprothrombin IIA and blood coagulation factor XIV, MW 62KDa and a key component of the natural anticoagulant pathway, is a zymogen, the activated form of which plays an important role in regulating anticoagulation, inflammation, cell death, and maintaining the permeability of blood vessel walls in humans and other animals. Activated protein C (APC) performs these operations primarily by proteolytically inactivating proteins Factor V_a and Factor $VIII_a$. APC is classified as a serine protease as it contains a residue of serine in its active site. In humans, protein C is encoded by the *PROC* gene, which is found on chromosome 2.

The zymogenic form of protein C is a vitamin K-dependent glycoprotein that circulates in blood plasma. Its structure is that of a two-chain polypeptide consisting of a light chain and a heavy chain connected by a disulfide bond. The protein C zymogen is activated when it binds to thrombin, another protein heavily involved in coagulation, and protein C's activation is greatly promoted by the presence of thrombomodulin and endothelial protein C receptors (EPCRs). Because of EPCR's role, activated protein C is found primarily near endothelial cells (i.e., those that make up the walls of blood vessels), and it is these cells and leukocytes (white blood cells) that APC affects.

Corresponding author: Dr. Nadia Madani Mohamad,
Alneelain University, Faculty of post graduate, Sudan.

Because of the crucial role that protein C plays as an anticoagulant, those with deficiencies in protein C, or some kind of resistance to APC, suffer from a significantly increased risk of forming dangerous blood clots (thrombosis).

Protein C may be measured by

- **Immunological:** by means of an ELISA assay Remember this measures only the amount of Protein C present and NOT its functional activity.
- **A clot-based functional APTT assay:** The time to clot formation after addition of a Protein C activator is determined and from this the amount of Protein C present can be determined.
- **A Chromogenic assay:** Protein C is activated using (commonly) Protac™, an extract of the venom of *Akistrodon contortrix contortri***x** and the concentration of Protein C is determined from the rate of colour change in the test sample due to cleavage of a chromogenic substrate.
- **A thrombin:** Generation-based test has also been shown to detect Protein C deficiency.

MATERIALS AND METHODS

Commercial kits are readily available for Protein Assays ,We used Enzymes Linked Immmuno Sorbent Assay (ELISA),and also we used a reference standard calibrated against the current International Standard for Protein C.

Most ELISA assays use either monoclonal or polyclonal antibodies against Protein C. blood sample collection in Trisodium citrate and separated to plasma sample and saved in cold condition until we do examination by ELIZA.

Reference Ranges

The plasma concentration of protein C in a healthy baby is in the region of 40 IU/dL. Levels increased with age and reach levels of ~60 IU/dL but may not reach true adult

RESULTS

60 persons were participates in this study; 50 patient with chronic kidney disease were represent case group while 10 healthy participant represent control group. 35(58.3%) of all group were female, whereas 25 (41.7%) were male (Table 1). All participate fall in age ranged of 15-88 years the mean age (51) (Table 2).

Table 1.

Gender			Frequency	Percent	p.value
Case	Valid	Male	20	40.0	0.566
		Female	30	60.0	
		Total	50	100.0	
Control	Valid	Male	5	50.0	
		Female	5	50.0	
		Total	10	100.0	

Table 2.

Variable	Case	Control	p.value
	mean±SD	mean±SD	
Age	54.21±21	32.8±17	0.004
Protein C	149.8±18.2	94.1±25	0.000

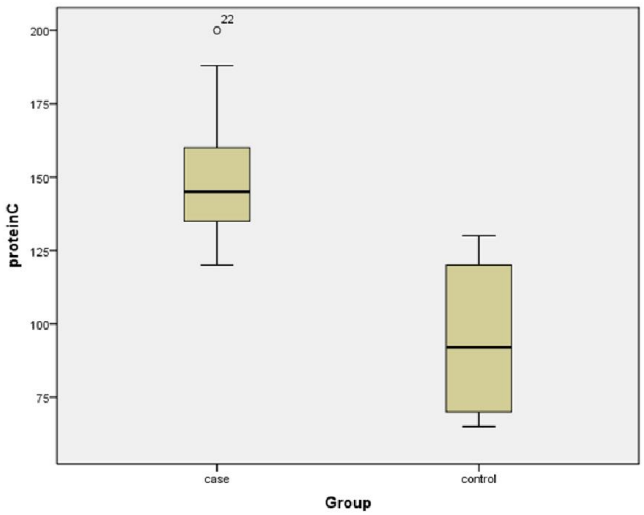

Figure 2. scatter plot shows correlation between protein C in chronic kidney disease patient and normal health persons (control)

According to other chronic disease 9(18%) of CKD patient have diabetes mellitus; while 10(20%) have hypertension (Table 3 and 4 respectively). Most of case group was make dialysis tow times per week 36(72%) (Table 5). The mean concentration of serum level of protein C among CKD patient was (149.8 IU/dL) while control group was (94.1 IU/dL). The serum level of protein C were significantly elevated in patient with CKD when compare with control group (p.value = 0.000).

Table 3.

DM			Frequency	Percent	p.value
Case	Valid	yes	9	18.0	0.151
		no	41	82.0	
		Total	50	100.0	
Control	Valid	no	10	100.0	

Table 4.

HTN			Frequency	Percent	p.value
Case	Valid	yes	10	20.0	0.125
		no	40	80.0	
		Total	50	100.0	
Control	Valid	no	10	100.0	

Table 5.

		NO of dialysis			
Group			Frequency	Percent	p.value
Case	Valid	1	14	28.0	0.000
		2	36	72.0	
		Total	50	100.0	
Control	Valid	0	10	100.0	

(Table 6, Figure1). Statistical correlation showed insignificant association of serum level of CKD with gender, diabetes mellitus and hypertension in CKD patients (p.value 0.566, 0.151 and 0.125 respectively) (Table 1, 3, 4 respectively).

Conclusion

In this study the serum level of protein C was significant with age and number of dialysis (p.value< 0.004, 0.000 respectively) (Table 2, 5 respectively)

REFERENCES

Cardiovascular Disease in Chronic Kidney Disease; Renal Association (2010).

Chronic kidney disease: early identification and management of chronic kidney disease in adults in primary and secondary care; NICE Clinical Guidelines (July 2014)

Collins, A.J., Couser, W.G. and Dirks, J.H., et al. World Kidney Day: An idea whose time has come. *J AM Soc Nephrol* 17:600

Detection, Monitoring and Care of Patients with Chronic Kidney Disease; Renal Association (2011)

Jump up ^ Cytokine Quantification in Drug Development: A comparison of sensitive immunoassay platforms (Report). Chimera Biotech. 2009. http://www.chimera-biotec.com/data/pdf/Cytokine_Quant_Comp_Final.pdf. Retrieved 26 January 2010.

Jump up ^ De La Rica, R. and Stevens, M. M. 2012. "Plasmonic ELISA for the ultrasensitive detection of disease biomarkers with the naked eye". *Nature Nanotechnology*, doi:10.1038/nnano.2012.186. edit

Jump up ^ Engvall, E. and Perlman, P. 1971. "Enzyme-linked immunosorbent assay (ELISA). Quantitative assay of immunoglobulin G". *Immunochemistry,* **8** (9): 871–4. doi:10.1016/0019-2791(71)90454-X. PMID 5135623.

Jump up ^ Food, U. S. and Drug Administration. "Food Allergen Partnership." Last accessed April 16, 2007. http://web.archive.org/web/20080325193553/www.cfsan.fda.gov/~dms/alrgpart.html

Jump up ^ J. Frank T. Griffin, J. F. T.; , Evelyn Spittle, Christie R. Rodgers, Simon Liggett, Marc Cooper, Douwe Bakker, and John P. Bannantine

Jump up ^ Leng, S., McElhaney, J., Walston, J., Xie, D., Fedarko, N., Kuchel, G. October 2008. "Elisa and Multiplex Technologies for Cytokine Measurement in Inflammation and Aging Research". *J Gerontol a Biol. Sci. Med. Sci.,* 63 (8): 879–84. doi:10.1093/gerona/63.8.879. PMC 2562869. PMID 18772478.

Jump up ^ Lequin, R. 2005. "Enzyme immunoassay (EIA)/enzyme-linked immunosorbent assay (ELISA)". *Clin. Chem.* 51 (12): 2415–8. doi:10.1373/clinchem.2005.051532. PMID 16179424.

Jump up ^ MedLinePlus. "HIV ELISA/western blot." U.S. National Library of Medicine. Last accessed April 16, 2007. http://www.nlm.nih.gov/medlineplus/ency/article/003538.htm

Jump up ^ Van Weemen, B.K. and Schuurs, A.H. 1971. "Immunoassay using antigen-enzyme conjugates". *FEBS Letters* **15** (3): 232–236. doi:10.1016/0014-5793(71)80319-8. PMID 11945853..

Jump up ^ Wide L, Porath J. Radioimmunoassay of proteins with the use of Sephadex-coupled antibodies. Biochem Biophys Acta 1966; 30:257-260.

Jump up ^ Yalow, R. and Berson, S. 1960. "Immunoassay of endogenous plasma insulin in man". *J. Clin. Invest.* 39 (7): 1157–75. doi:10.1172/JCI104130. PMC 441860. PMID 13846364.

Levey, A.S. and Coresh, J. 2012. Chronic kidney disease. Lancet. Jan 14;379 (9811):165-80. Epub 2011 Aug 15.

Levey, A.S. Atkins, T. and Coresh, J. et al:. 2007. Chronic Kidney Disease as global public health problem:Approaches and initiatives: Aposition Statement from KDIGO. Kidney Int (in press).

Levey, A.S., Andreoli, S.P., DuBose, T., Provenzano, R. and Collins, A.J. 2007. CKD: Common, harmful, and treaTable - World Kidney Day 2007.Am J Kidney Dis 49:175-179.

Lipid modification - cardiovascular risk assessment and the modification of blood lipids for the prevention of primary and secondary cardiovascular disease; NICE Clinical Guideline (July 2014).

Mitra, P.K., Tasker, P.R. and Ell, M.S. 2007 Jun. Chronic kidney disease. BMJ. 16;334(7606):1273.

Palmer, S.C., Navaneethan, S.D. and Craig, J.C. et al. HMG CoA reductase inhibitors (statins) for people with chronic kidney disease not requiring dialysis. Cochrane Database Syst Rev. 2014 May 31;5:CD007784. doi: 10.1002/14651858.CD007784.pub2.

Stevens, P.E., O'Donoghue, D.J. and de Lusignan, S. et al. 2007 Jul. Chronic kidney disease management in the United Kingdom: NEOERICA project Kidney Int. 72(1):92-9. Epub 2007 Apr 18.

****